WE CLAIM:

1. A method for determining a heating value of a fuel gas comprising the steps of:

exciting at least one molecule of said fuel gas, resulting in chemiluminescense of at least one chemical bond of said at least one molecule; and

measuring an intensity of said chemiluminescense of said at least one chemical bond, resulting in determination of said heating value of said fuel gas.

2. A method in accordance with Claim 1, wherein said at least one molecule is excited by a continuous excitation source.

3. A method in accordance with Claim 1, wherein said at least one molecule is excited by a periodic excitation source.

4. A method in accordance with Claim 1, wherein said at least one molecule is excited by an excitation source selected from the group consisting of electric arc, spark, plasma, laser, flash lamp, pilot flame and combinations thereof.

5. A method in accordance with Claim 1, wherein a fuel gas absolute pressure of said fuel gas is less than about one atmosphere.

6. A method in accordance with Claim 1, wherein said fuel gas is introduced into a chamber in which said at least one molecule is excited.

7. A method in accordance with Claim 6, wherein said chamber comprises at least one focusing element.

8. A method in accordance with Claim 7, wherein said at least one focusing element comprises at least one mirror.

9. A method in accordance with Claim 7, wherein said at least one focusing element comprises at least one curved side of said chamber.

10. A method in accordance with Claim 1, wherein said intensity of said chemiluminescense is measured at at least one chemiluminescense wavelength in at least one of an ultraviolet spectrum and a visible spectrum.

11. A method in accordance with Claim 1, wherein said intensity of said chemiluminescense is measured at at least one chemiluminescense wavelength in a range of about 200 nm to about 600 nm.

12. A method in accordance with Claim 1, wherein said at least one chemical bond is a carbon-hydrogen (C-H) bond.

13. A method in accordance with Claim 1, wherein said at least one chemical bond is a carbon-carbon (C-C) bond.

14. A method for determining a heating value of a fuel gas comprising the steps of:

measuring a chemiluminescense intensity of at least one chemical bond in a known volume of said fuel gas;

determining an amount of said at least one chemical bond in said known volume of said fuel gas; and

calculating said heating value of said fuel gas based upon said amount of said at least one chemical bond.

15. A method in accordance with Claim 14, wherein said fuel gas comprises one fuel gas component.

16. A method in accordance with Claim 14, wherein said fuel gas comprises a plurality of fuel gas components.

17. A method in accordance with Claim 14, wherein said fuel gas comprises at least one of an alkane hydrocarbon and an inert gas.

18. A method in accordance with Claim 14, wherein said chemiluminescense is produced by exciting said at least one chemical bond with an excitation source selected from the group consisting of electric arc, spark, plasma, laser, flash lamp, pilot flame and combinations thereof.

19. A method in accordance with Claim 14, wherein said chemiluminescense is produced by exciting said at least one chemical bond with a continuous excitation source.

20. A method in accordance with Claim 14, wherein said chemiluminescense is produced by exciting said at least one chemical bond with a periodic excitation source.